

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Johannes Jacobus Theodorus DE JONG et al. Attn: PCT Branch

Application No. New U.S. National Stage of PCT/EP04/006601

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Docket No.: 116952

For: POLYMERIZATION PROCESS FOR PREPARING (CO)POLYMERS

**SUBMISSION OF THE ANNEXES TO THE
INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

Commissioner for Patents
P.O. Box 1450
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Sir:

Attached hereto is a submission of the annexes to the International Preliminary Report on Patentability (Form PCT/IPEA/409). The attached translated material replaces page 1 of the specification and claims 1-4.

Respectfully submitted,



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POLYMERIZATION PROCESS FOR PREPARING (CO)POLYMERS

The present invention relates to an aqueous dispersion polymerization process for preparing a (co)polymer wherein one or more organic peroxides are used as initiator (as a source of free radicals) in conjunction with an effective amount of one or more controlling agents. The invention also relates to formulations comprising organic peroxide(s) and an effective amount of said controlling agent(s) suitable for use in said aqueous dispersion polymerization process. The invention finally relates to (co)polymers obtainable by the dispersion polymerization process.

Over the years, there has been a large number of publications describing the polymerization of ethylenically unsaturated monomers using an organic peroxide as initiator. For example, US 5,155,192 discloses storageable and/or transportable compositions containing peroxydicarbonate to which an organic peroxide has been added to retard the decomposition of said peroxydicarbonate. The compositions of US 5,155,192 are suitable for use in the conventional mass, suspension, or emulsion (co)polymerization of ethylenically unsaturated monomers. In US 5,155,192 no further specifications of the peroxydicarbonates to be used are given, such as their solubility or their half life.

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An unwanted side effect frequently observed in conventional polymerization processes is the formation of so-called fish eyes in the (co)polymer. One explanation for fish eyes is that they are caused by small quantities of polymer material having a molecular weight that differs considerably from the average molecular weight of the rest of the polymer material. Due to a difference in melt property between said polymer material and the "average" polymer material, irregularities can occur in the final shaped polymer material. It will be clear that this phenomenon is undesirable, for example, for the transparency and uniformity of the final (co)polymer material, particularly in thin films. Furthermore, the presence of fish eyes may even be detrimental to the strength

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US 3,778,422 pertains to a process for the production of vinyl halide polymers in which vinyl halide monomers are polymerized in the presence of an initiator that
5 comprises an organic peroxydicarbonate.

US 6,399,728 describes a process for the polymerization of vinyl chloride using a thermally stabilized initiator composition comprising at least one dialkyl peroxydicarbonate and a stabilizing effective amount of a compound of the general structure $R-O-C(=O)-CH=CH-C(=O)-O-R$.

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Amended claims

1. Polymerization process for preparing a (co)polymer wherein one or more organic peroxides selected from the group consisting of diacyl peroxides, peroxyesters, peroxydicarbonates, and mixtures thereof are used in conjunction with an effective amount of one or more controlling agents selected from the group consisting of organic hydroperoxides, ethylenically unsaturated organic compounds that preferably cannot homopolymerize, compounds with labile carbon-hydrogen bonds, oximes, and mixtures thereof, with the proviso that the solubility of the peroxydicarbonate(s) in water at 0°C is at least 5 ppm, preferably the solubility of all organic peroxides in water at 0°C is at least 5 ppm, and wherein the process is a conventional aqueous dispersion polymerization process or an aqueous dispersion polymerization process wherein at least part of the one or more organic peroxides used as initiator is dosed to the reaction mixture at the polymerization temperature.
2. A polymerization process according to claim 1 wherein the one or more organic peroxides are selected from the group of diacyl peroxides, peroxyesters, and mixtures thereof
3. A polymerization process according to claim 2 wherein the one or more organic peroxides have a solubility in water at 0°C of at least 5 ppm
4. A polymerization process according to any one of claims 1 to 3 wherein the one or more organic peroxides are selected from the group consisting of organic peroxides having a half-life of at least 0.0001 hour and at most 1.0 hour at the polymerization temperature and mixtures thereof

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